REMARKS/ARGUMENTS

After the foregoing amendments, claims 1-2, 8-13, 19-22, and 27-29 are currently pending in this application. Claims 4-7, 14-18 and 23-26 have been canceled without prejudice. Claims 1, 12 and 22 have been amended to incorporate subject matter similar to that previously included in canceled claims 6-7, 17-18 and 24-25, respectively, which the Applicants believe is allowable over the prior art of record. Furthermore, the claims have been amended to more distinctly claim subject matter which the Applicants regard as the invention.

Rejection of claims 1, 12 and 22 under 35 U.S.C. 102(e)

The Examiner rejected claims 1, 12 and 22 under 35 U.S.C. 102(e) as being unpatentable over U.S. Patent Application Publication No. US 2005/0094598 A1 (Medvedev et al.). Medvedev discloses a MIMO system with multiple transmission modes. Based on a determination of system conditions, such as SNR, a transmission mode is selected from among several available modes. In a uniform transmission scheme, total transmit power is allocated to equally over Ns eigenmodes, for Ns = Nt (number of transmit antennas) = Nr (number of receive antennas). Claims 1, 12 and 22 are distinguished in that a transmit power constraint is observed for N not equal to M (where N is number of transmit antennas and M is number of receive antennas). Furthermore, the claimed transmit power constraint is not disclosed or taught by Medvedev:

> "to transmit according to a power constraint for each individual transmit antenna path, wherein if $N \leq M$, then $\mathbf{D} = \mathbf{I} \cdot \mathrm{sqrt}(P_{max}/N)$, with $\mathbf{I}$ as an identity matrix, such that the power transmitted by each of the N plurality of antennas is the same and equal to P_{max}/N; and if $N>M$, then $\mathbf{D} = \mathrm{sqrt}(d \cdot P_{max}/N) \cdot \mathbf{I}$, such that the power transmitted by antenna i for i = 1 to N is $(d \cdot P_{max}/N) \cdot (\mathbf{V}\mathbf{V}^{H})_{ii}$, and $d_p = d$ for p = 1 to L."

Claims 1, 12 and 22 are also rejected under 35 USC 102(b) in view of U.S. Publication 2003/0125040 (Walton et al.) and U.S. Patent 6,058,105 (Hochwald et

al.). Walton discloses a method for MIMO processing using an eigenvector matrix (E). Hochwald discloses a method for MIMO processing according to a water pouiring algorithm (col. 8, lines 33-46).

Neither Walton nor Hochwald teach a power constraint according to amended claims 1, 12 and 22. Furthermore, Hochwald teaches away from the claimed invention, as the water pouring (a.k.a. water filling) method is described in the present application as being less efficient and replaced by the preferred claimed method. (See page 5, lines 9-20 of the Applicant's specification).

In view of the arguments presented above, Applicants respectfully request that the 35 USC 102 rejections to claims 1, 12 and 22 be withdrawn.

Rejection of claims 6-9 and 17-20 under 35 U.S.C. 103(a)

The Examiner rejected claims 6-9 and 17-20 under 35 U.S.C. 103(a) as being unpatentable over Medvedev in view of U.S. Patent Application Publication No. US 2004/0013212 (Benesty et al.).

Benesty discloses a method and apparatus for receiving MIMO signals. However, the Applicants disagree that the combination of Medvedev and Benesty teach the claimed invention as claimed in claims 6-9 and 17-20 (and now amended claims 1, 12, and 22). Firstly, Benesty assumes that transmit antennas M and receive antennas N are related as follows: N>=M (par. 0032, 0044, and 0056). In contrast, claims 1, 12 and 22 include a power constraint for either N<=M or N>M. Secondly, Benesty fails to teach the following claimed power constraint for each transmit antenna:

> "to transmit according to a power constraint for each individual transmit antenna path, wherein if $N \leq M$, then $\mathbf{D} = \mathbf{I} \cdot \mathrm{sqrt}(P_{max}/N)$, with **I** as an identity matrix, such that the power transmitted by each of the N plurality of antennas is the same and equal to P_{max}/N; and if $N>M$, then $\mathbf{D} = \mathrm{sqrt}(d \cdot P_{max}/N) \cdot \mathbf{I}$, such that the power transmitted by antenna i for i = 1 to N is $(d \cdot P_{max}/N) \cdot (\mathbf{V}\mathbf{V}^{H})_{ii}$, and $d_p = d$ for p = 1 to L."

The Applicants submit that claims 1, 12, 22 and their dependent claims 2, 8-11, 13, 19-21, and 27-29 are patentable over the prior art of record.

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, the Applicants respectfully submit that the present application is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Sugar et al.

By_____
Anthony L Venezia
Registration No. 48,382

Volpe and Koenig, P.C.
United Plaza, Suite 1600
30 South 17th Street
Philadelphia, PA 19103
Telephone: (215) 568-6400
Facsimile: (215) 568-6499

ALV/bbf
Enclosures